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Tatsuhisa Yokoi

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EXAMINER

NGUYEN, TU MINH

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/589,204	Applicant(s) YOKOI ET AL.	
	Examiner TU M. NGUYEN	Art Unit 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-17, 20, 23, 24, 27 and 32-34 is/are rejected.
- 7) ☒ Claim(s) 18, 19, 21, 22, 25, 26 and 28-31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20090317</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. An Applicant's Request for Continued Examination (RCE) filed on June 12, 2009 has been entered. Per instruction from the RCE, an enclosed Applicant's Amendment has been entered. Claims 13, 23, 33, and 34 have been amended. Overall, claims 13-34 are pending in this application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. **Claims 13-16, 23, and 32-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Kawashima et al. (U.S. Patent 6,851,258).**

Re claims 33-34, as shown in Figures 1-5, 7, 8, and 22, Kawashima et al. disclose a regeneration controller and a method for eliminating particulate matter accumulated in an exhaust purification apparatus (particulate filter (41)) that is arranged in an exhaust system (2) of an internal combustion engine (1), the regeneration controller comprising:

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- a heating section (see Figure 3) for heating the exhaust purification apparatus to eliminate the particulate matter accumulated in the exhaust purification apparatus when an estimated accumulation amount is greater than a reference accumulation amount (step S13 in Figure 4 with YES answer), wherein the heating section obtains the estimated accumulation amount by estimating the amount of particulate matter accumulated in the exhaust purification apparatus (see Figure 8 and lines 7-11 of column 9); and

- a mode change section for changing exhaust purification apparatus heating modes (from a first phase to a second phase and to a third phase as depicted in Figures 22) when heating the purification apparatus if the estimated accumulation amount is within a mode change range (in Kawashima et al., when the estimated accumulation amount of particulate matter is at or below a threshold value p , the third phase starts (see Figure 7 and lines 40-49 of column 8)), wherein:

- an exhaust having an air-fuel ratio flows in the exhaust system;

- the mode change range (from second phase to third phase) is set in accordance with a state in which a great part of the accumulated particulate matter is eliminated from the exhaust purification apparatus (see Figure 7); and

- the mode change section changes the heating mode when the estimated accumulation amount is within the mode change range from a normal heating mode (first phase), for slowly burning the particulate matter in the exhaust purification apparatus by continuously keeping the air-fuel ratio in the exhaust system low, to a burn-up heating mode (second phase or third phase), for burning up the particulate matter accumulated in the exhaust purification apparatus at once by intermittently lowering the air-fuel ratio in the exhaust system so that a temperature of a catalyst

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bed is elevated so that the temperature of the catalyst bed is higher in the burn-up heating mode than in the normal heating mode (see at least lines 14-49 of column 8),

wherein in the burn-up heating mode (third phase), the amount of fuel repeatedly added, the period of fuel addition, and the period when fuel is not added are set so as to realize activated oxygen state and exhaust temperatures at upstream and downstream sides of the exhaust purification apparatus capable of burning up the particulate matter accumulated in the exhaust purification apparatus (during third phase, a fuel is injected so as to adjust an oxygen state of exhaust gas in the filter in order to keep the combustion under control and therefore, to maintain the filter under regeneration within a desired temperature range) (also see lines 50-67 of column 16).

Re claims 13 and 23, as shown in Figures 1-5, 7, 8, and 22, Kawashima et al. disclose a regeneration controller and a method for eliminating particulate matter accumulated in an exhaust purification apparatus (particulate filter (41)) that is arranged in an exhaust system (2) of an internal combustion engine (1), the regeneration controller comprising:

- a heating section (see Figure 3) for heating the exhaust purification apparatus to eliminate the particulate matter accumulated in the exhaust purification apparatus when an estimated accumulation amount is greater than a reference accumulation amount (step S13 in Figure 4 with YES answer), wherein the heating section obtains the estimated accumulation amount by estimating the amount of particulate matter accumulated in the exhaust purification apparatus (see Figure 8 and lines 7-11 of column 9); and

- a mode change section for changing exhaust purification apparatus heating modes (from a first phase to a second phase and to a third phase as shown in Figures 22) when heating the

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purification apparatus if the estimated accumulation amount is within a mode change range (in Kawashima et al., when the estimated accumulation amount of particulate matter is at or below a threshold value p , the third phase starts (see Figure 7 and lines 40-49 of column 8)), wherein:

- an exhaust having an air-fuel ratio flows in the exhaust system;
- the mode change range (from second phase to third phase) is set in accordance with a state in which a great part of the accumulated particulate matter is eliminated from the exhaust purification apparatus (see Figure 7); and
- the mode change section changes the heating mode when the estimated accumulation amount is within the mode change range and less than or equal to a normal burn-up start determination value (p), which is slightly greater than an end determination value, from a normal heating mode (first phase), for slowly burning the particulate matter accumulated in the exhaust purification apparatus by continuously keeping the air-fuel ratio in the exhaust system low, to a burn-up heating mode (second phase or third phase), for burning up the particulate matter accumulated in the exhaust purification apparatus at once by intermittently lowering the air-fuel ratio in the exhaust system so that a temperature of a catalyst bed is elevated so that the temperature of the catalyst bed is higher in the burn-up heating mode than in the normal heating mode (see at least lines 14-49 of column 8).

Re claims 14-16, the regeneration controller of Kawashima et al. further comprises a difference detection unit (36) for detecting at least one of an exhaust pressure difference and an exhaust temperature difference between an upstream side (37) and a downstream side (38) of the exhaust purification apparatus, in which the exhaust purification apparatus (41) is a downstream side one of at least two exhaust purification apparatuses (oxidation catalysts at an upstream side

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of (41)) arranged in the exhaust system; wherein the mode change section determines whether to change the heating mode to the burn-up heating mode based on at least one of the exhaust pressure difference and the exhaust temperature difference detected by the pressure detection unit.

Re claim 32, in the regeneration controller of Kawashima et al., the mode change section determines if the estimated accumulation amount is within the mode change range, and changes the heating mode when the estimated accumulation amount is within the mode change range, from the normal heating mode to the burn-up heating mode (see Figure 7 and lines 40-49 of column 8).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 17, 20; 24; and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawashima et al. as applied to claims 14; 15; and 16, respectively, above, in view of Tashiro et al. (U.S. Patent 6,622,480).

Re claims 17, 24, and 27, the regeneration controller of Kawashima et al. discloses the invention as cited above, however, fails to disclose that the mode change section increases the estimated accumulation amount and continues the burn-up heating mode when the exhaust

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pressure difference or the exhaust temperature difference detected by the difference detection unit is greater than a mode change reference value.

As shown in Figures 1 and 8, Tashiro et al. disclose a diesel particulate filter unit (4) and a regeneration control method of said unit. As indicated in step S15 of Figure 9, Tashiro et al. teach that it is conventional in the art to compute an incremental amount of particulate matter removed during a regeneration step of the filter unit and increase a total amount of removed particulate matter until a remaining amount is equal to a minimum value when such regeneration is deemed completed. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Tashiro et al. in the controller of Kawashima et al., since the use thereof would have been routinely practiced by those with ordinary skill in the art to effectively regenerate a particulate filter.

Re claim 20, in the modified regeneration controller of Kawashima et al., as taught by Tashiro et al., the mode change section limits the number of times for increasing the estimated accumulation amount to a reference number of times or less.

Allowable Subject Matter

6. Claims 18, 19, 21, 22, 25, 26, and 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

7. Applicant's arguments with respect to the references applied in the previous Office Action have been fully considered but they are moot in view of the new ground(s) of rejection.

Prior Art

8. The IDS (PTO-1449) filed on March 17, 2009 has been considered. An initialized copy is attached hereto.

Communication

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Tu M. Nguyen/

TMN

Tu M. Nguyen

June 22, 2009

Primary Examiner

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